IB Series

Precision Balance

Operation Manual

RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale®

ISO 9001 REGISTERED

42193

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About This Manual

This manual is intended for use by service technicians responsible for installing and servicing the IB Series electronic tuning fork scale.

Configuration and calibration of the scale can be accomplished using the IB Series front panel keys.

Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems distributor site at www.rlws.com.

1.0 Introduction

The IB Series is an advanced precision weighing instrument utilizing a high-precision electronic tuning fork sensor which provides stable measurement over years of usage. It provides ultra-fast response time and greatly improved resistance to external vibrations. Features include:

- Measures weight in thirteen units (mg, g, kg, ct, oz, lb, ozt, dwt, gr, HK tael, SIN tael, TW tael and mommes)
- Switchable for straightweighing, piece count, or over/under checkweighing mode
- Built-in automatic zero tracking
- Die-cast aluminum housing, making it resistant to chemicals and electromagnetic interference
- Counting mode, checkweighing mode, calculation factor mode, and percentage mode capabilities
- Large .5" (12.5mm) liquid crystal display (LCD)
- Optional glass breeze shield available for all round pan models
- Available in 115 VAC adapter. 230 VAC adapter (optional)

1.1 Operating Modes

The IB Series has four weighing modes:

Normal (weighing) mode

Normal mode is the “production” mode of the scale. The IB Series displays gross or net weights as required, using the LCD annunciators described in Table 1-1 on page 4 to indicate scale status and the type of weight value displayed.

A checkweighing function can be used with the normal weighing mode. It is convenient for classifying weighing items according to whether they fall within a pre-determined weight range. The limit setting procedure is described in Section 4.1 on page 7.

Counting mode

The IB Series is capable of parts counting. Sampling is done by placing the sample on the scale and designating the number of pieces in the sample. Four preset sample quanitities are available.

Entering the counting mode is done through the front panel keypad, and is explained in detail in Section 4.0 on page 8.

Calculation Factor mode

In calculation factor mode, the desired index is memorized, the index for the weight of the item placed on the scale is calculated and the calculated value is displayed. This is a convenient function that allows conversion into various units, and is explained in detail in Section 5.0 on page 11.

Percentage mode

In percentage mode, the weight of the sample selected as the reference is memorized as 100%. The ratio between the item being measured and the reference is displayed as a percentage. The percentage mode is explained in detail in Section 6.0 on page 13.

1.2 Unpacking and Inspection

Each component of the IB Series system is packed in a specially designed carton. Remove each component from its carton, separate the component from its polystyrene shell assembly, and set the assembly aside. Inspect the carton interior and inner panels to be sure that all accessories have been removed. Items included in this carton include:

- IB Series precision balance scale
- Weighing pan and pan base
- AC adaptor
- Operation manual
- Dust cover

Be sure to replace all packing materials within the carton set. Store the carton set in a secure area so it is available whenever shipment of the scale is required.

Immediately after unpacking, a visual inspection of the instrument should be conducted. Keep the scale in an upright position. The shipper and Rice Lake Weighing Systems should be notified immediately if any damage occurred during transportation. Instructions for assessment of damage and further procedures will then be determined.

1.3 Unlocking

Locate a black rubber cap at the top of the scale. Remove the cap to find a lock lever in it. Turn the lever to the center of the scale to unlock.

Note: Before relocation or transportation, turn the lever to the edge of the scale for locking mechanism.

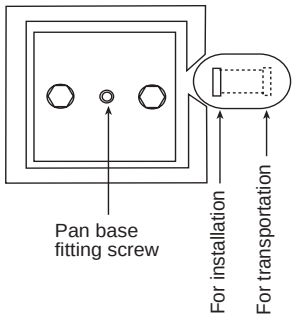


Figure 1-1. Unlocking Scale

1.4 Repacking

If the IB Series counting scale must be returned for modification or repair, be sure that it is properly packed with the original packing material and original carton assembly if possible. Any damage caused by improper packaging will not be covered by the warranty.

1.5 Site Location and Precautions

Try to select a good, clean environment for installing the scale. The following environmental factors may cause the scale to give inaccurate measurements:

- Installation on a weak surface that may flex when objects are put on it or put on the scale.
- Greatly varying temperature and humidity.
- Vibration or an unstable surface for installation of the scale.
- Air flow from heaters or air conditioning units.
- Corrosive gases or large amounts of dust.
- Direct, intense sunlight.

The IB Series is a precision instrument and requires careful handling. Certain precautions must be taken to ensure weighing accuracy.

- Weighing accuracy may be affected by installation or extended usage. To ensure accurate measurement, perform calibration (as described in Section 2.0).
- Always remove objects from the weigh pan gently. Shock, especially applied to the sides of the scale, may result in loss of accuracy.
- If the capacity of the scale is exceeded, an *[o-Err]* error message is displayed. Do not leave an over-capacity load on the pan.

1.6 Weighing Pan Attachment

Use the following steps to properly attach the IB Series weigh pan.

1. Attach the pan base onto the center of the main base.
2. Fix the position of the pan base by tightening the attachment screw (as shown in Fig 1-1) using a screwdriver or coin.

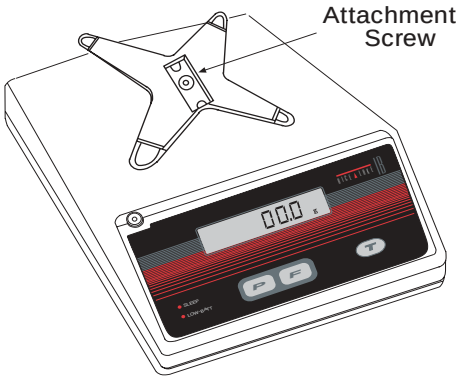


Figure 1-2. Weighing Pan Attachment

3. Place the weighing pan on the pan base. (weighing pan comes in both retangular and round types).

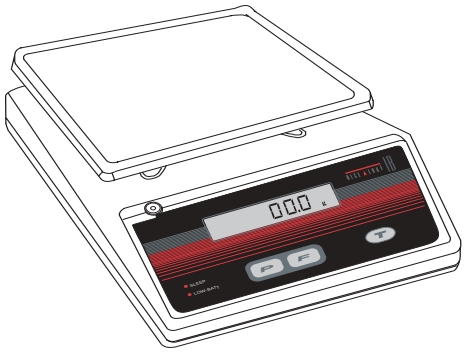


Figure 1-3. Weighing Pan

1.7 Leveling the Scale

The scale must be level for proper operation. Use the four level adjusters located at the four corners of the scales main unit to adjust the horizontal position of the scale until the bubble of the level indicator lies within the red circle. Ensure that the scale sits solidly and does not wobble due to uneven adjustment.

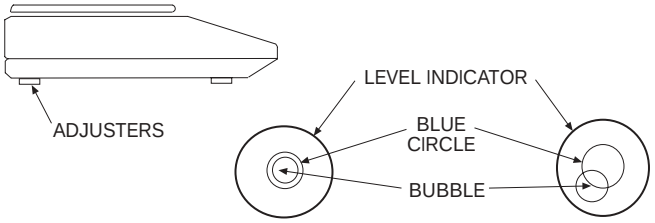


Figure 1-4. Bubble Adjustment

1.8 Main Components

The main parts of the IB Series balance are:

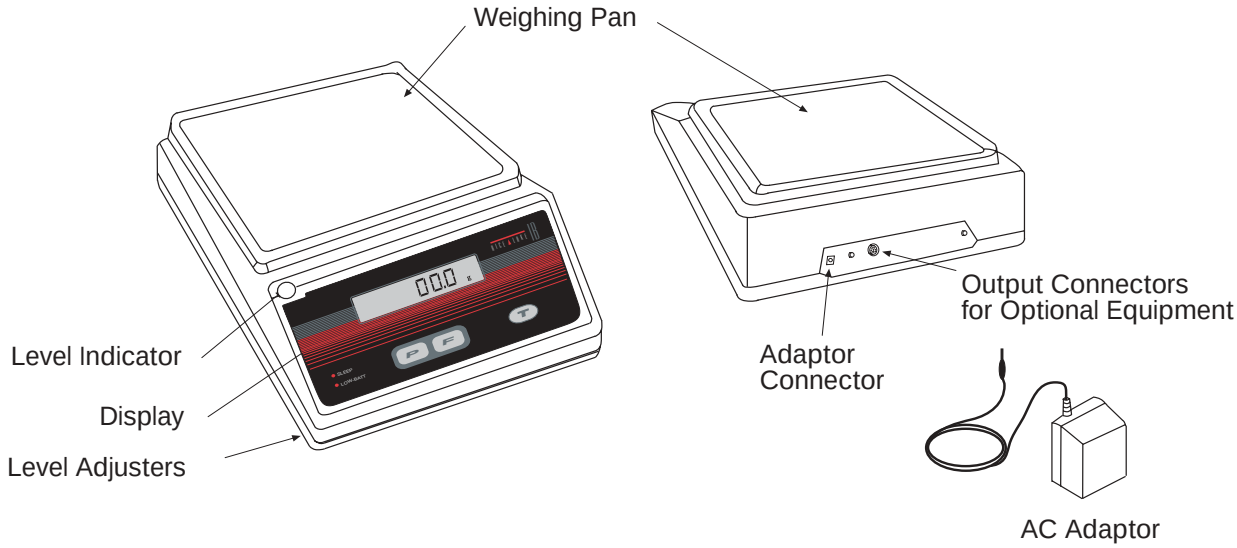


Figure 1-5. Main Component Parts of the IB Series

1.9 Front Panel Keypad

Table 1-1 on page 4 shows the IB Series LED annunciators, keypad, and normal mode key functions.

Figure 1-6. Front Panel Keypad

The LCD annunciators shown on the IB Series front panel describe the indicator functions assigned in setup mode. In setup and calibration mode, the keys are used to navigate through menus, select digits within numeric values, and increment/decrement values. The key symbols shown in the LCD display describe the functions assigned in setup mode.

Indicator Symbols	Meaning
g	Unit display for weighing mode
PCS	Unit display for counting mode
%	Unit display for percentage scale
#	Unit display for index scale
∑	Display during total mode (displayed in conjunction with each scale mode's unit display).
M	Indicates value setting in progress for limit or sampling functions.
◎	Scale stability display (scale is unstable when not displayed).
◂	Display indicates automatic memory update in index mode (simplified SCS method).
	Indicates the measurement range and remaining weight. In Comparator Mode, the bar graph performs judgments.

Table 1-1. LCD Annunciator Functions

The front panel operation key symbols describe the functions assigned to the scale.

Operation Key	Function
P	Sets limit function or cancels functions
F	• Sets and memorizes data in the count mode and when the limit function is operating. • Calls up and selects functions and items. • Selects row during numerical setting (limit function).
T	• Selects operation zero and tare subtraction. • Selects input numeral during numerical setting (limit function).

Table 1-2. Front Panel Key Functions

1.10 Start-up Self Test

A self test must be performed prior to using the scale. To perform a self test, do the following:

1. Connect the AC power adapter to the IB Series scale and insert into a 115V service outlet.
2. Press the ON/OFF key. All segments and characters light for a self test. Confirm that all segments and characters are lit. After a few moments, the display reads *[0.00g]*:

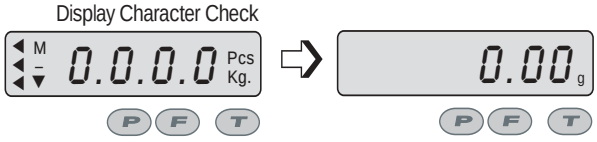


Figure 1-7. Display Character Check

3. Verify that the display changes by touching the pan slightly. It should return immediately to *[0.00g]* upon release. A flashing *[g]* annunciator means that the scale has not yet stabilized.

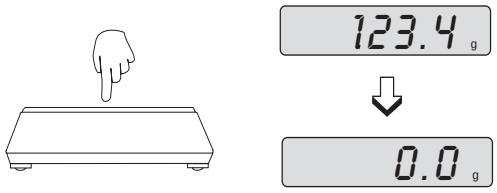


Figure 1-8. Verifying Scale Weight

2.0 Calibration

This section describes procedures for calibrating the IB Series scale. Follow the steps in Table 2-1 to calibrate the IB Series scale.

Step	Action
1	Hold down the F key until *[Func]* ➔ *[CAL]* appear in sequence, then release the key.
2	Hold down the T key, then press the F key, then release both keys.
3	The display will show *[unit].* Select weight unit from parameters “1” to “d”, by pressing the T key. The contents of the parameters are the same as at function *[71 uA]*. After setting the parameter, press the F key. *Note: Unit will not appear in setting at [1 SEt 1] and [73 ub 0] at the same time. The display will advance to on 0. In this case, use a reference weight of the weight unit selected in function [71 uA].*
4	*[on 0]* appears. The scale will automatically be set to the zero point. Verify that nothing is placed on the weighing pan.
5	After the IB performs the zero adjustment, *[on FS]* automatically appears. Gently place the designated calibration weight on the center weigh pan (see Table 2-2 below for designated calibration weights).
6	When calibration is complete, the scale automatically returns to the weighing mode.

Table 2-1. Calibration Steps for the IB Series Scale

Notes:

- *Press the* P *key to cancel calibration procedures and return to the weight display.*
- *If [o-Err] appears on the display, the weight exceeds the scale capacity.*
- *Standard calibration weight is 1/2 capacity. However, when possible, calibrate using a full capacity weight. See Table 2-2 below for the unit system capacities.*
- *If [1-Err] appears on the display, the calibration weight is less than 50% of the standard.*
- *If [2-Err] appears on the display, an object other than the calibration weight is on the pan, or the display tolerance (1%) is exceeded.*

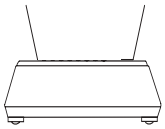
Unit No. (mark)	IB-1000	IB-2000	IB-5000	IB-10K	IB-15K
1 (mg)	100,000	2,000,000	5,000,000	10,000,000	15,000,000
2 (g)	1000	2000	5000	10,000	1,500
3 (kg)	1	2	5	10	15
4 (ct)	5,000	10,000	25,000	50,000	75,000
5 (oz)	35	70	170	350	520
6 (lb)	2.2	4.4	11	22	33
7 (ozt)	32	64	160	320	480
8 (dwt)	640	1200	32000	6400	9600
9 (gr)	15,000	30,000	77,000	150,000	230,000
A (tl)	26	53	130	260	400
b (tl)	26	52	130	260	390
c (tl)	26	53	130	260	400
d (mom)	260	530	1,300	2,600	4,000

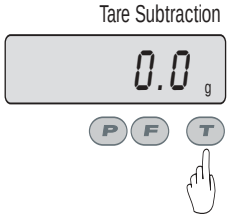
Table 2-2. Unit System Capacities

3.0 Measuring Weight

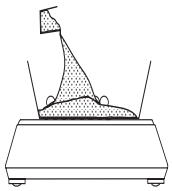
This section describes procedures for tare subtraction and weighing on the IB Series scale. Follow the steps below for tare subtracting and weighing on the IB Series scale.

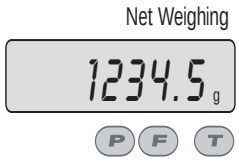
1. Place a container on the weigh pan, press the T key. The zero display appears.



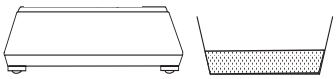


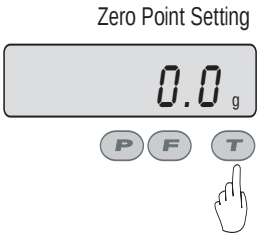
2. Place the product in the container. The net weight is displayed.



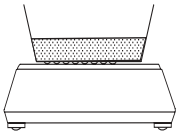


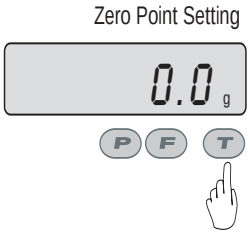
3. If you wish to remove the product or to return the display to zero, press the T key.



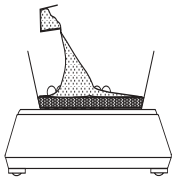


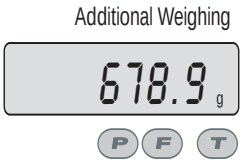
4. Without removing the product, press the T key.





5. Add the next product quantity. Only the additional amount is displayed.





Notes:

- *Tare subtraction procedure is the same for weighing or count modes.*
- *When tare weighing is performed, product weighing range is reduced by the amount of the tare weight.*

  weighing range = capacity - tare weight

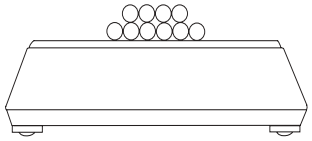
- *A flashing [g] indicator means the scale has not stabilized; when the indicator remains lit, the scale has stabilized. If weighing is performed in an unstabilized condition, accurate weigh results will not be returned.*
- *[0-ERR] appears if the load exceeds roughly 101% of the scale capacity. The net weighing range will be reduced by the tare container from the capacity of the scale.*

4.0 Count Weighing

Count weighing is used to determine piece count rather than weight. In order for the scale to perform this function it must know the average piece weight. By loading a specified number of pieces on the pan and entering that count, the scale calculates and stores in memory the piece weight for that product. This process is referred to as "sampling." For example, ten pieces are placed on the scale. When "10" is entered, the unit piece weight is set.

Sampling

Average Unit Weight = Piece Weight



10 pieces are placed on the scale

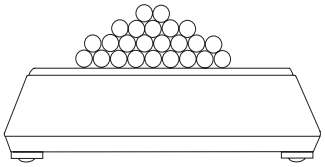
Total Weight = 10g

$$\frac{\text{Total Wt. 10 g}}{\text{Piece Count 10}} = \text{Piece Weight} = 1\text{g}$$

Next, the product to be weighed is placed on the scale. The scale calculates the piece count by dividing the total weight by the piece weight.

Calculating Piece Count

$$\frac{\text{Total Weight}}{\text{Piece Weight}} = \text{Piece Count}$$



A load of product is placed on the scale

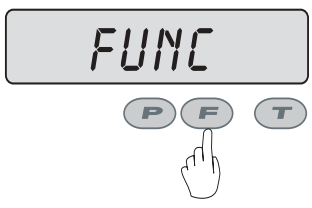
Total Weight = 250g

$$\frac{\text{Total Wt. 250 g}}{\text{Piece Weight 1 g}} = \text{Piece Count} = 250\text{pcs}$$

4.1 Count Mode Setting Procedure

1. Hold down the F key for about four seconds. Release when the *[Func]* display appears.

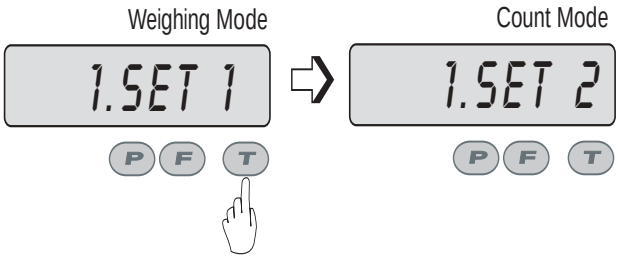
Function Access



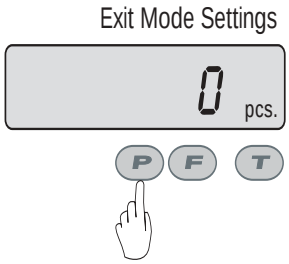
2. The first item of the function display appears: mode type.

Mode Type

3. If the weighing mode display appears, press the T key to enter the count mode.



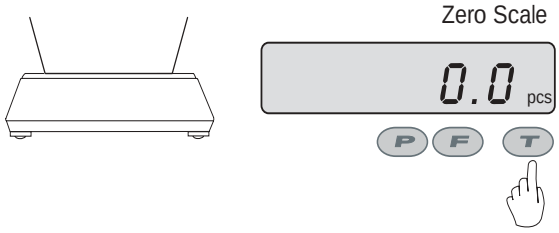
4. To exit the function setting display and enter the count mode press the P key.



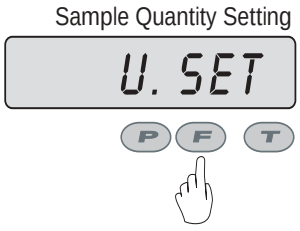
4.2 Self Counting System

Self Counting System (SCS) allows the user to start with any sample quantity selected. The concept of SCS keeps the user within built-in parameters. If the user adds more than three times the pieces previously on the scale, a message will display indicating pieces must be removed to get back within the built-in parameters. If the user stays within the parameters, the count display continues to flash, advising that SCS is active.

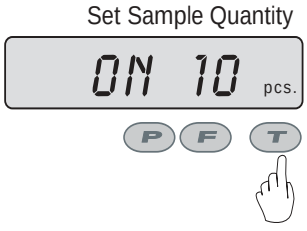
1. Place the tare vessel on the weighing pan and then press the T key. Also perform this operation if the display does not indicate zero.



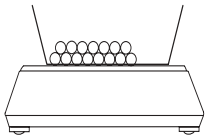
2. Continuously press the F key until *[U SEt]* message is displayed.



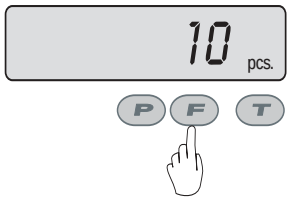
3. The display flashes, indicating that a value must be entered. Set the desired quantity of the sample by pressing the T key. The displayed quantity will be incremented by one according to the pattern indicated below each time the T key is pressed



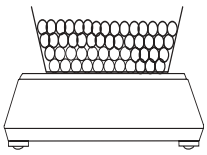
4. Place the selected number of items in the tare vessel and then press the F key. The display will temporarily go blank and a tone will be emitted, indicating the quantity has been memorized. The *[◂]* flashes, indicating that memory is being updated.



Sample Quantity Memorized

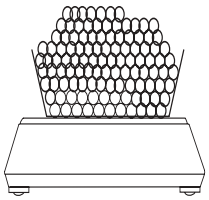


5. If additional items are placed in the tare vessel (maximum of three times the displayed quantity), the new quantity will be memorized. A tone will then be emitted indicating the new quantity has been memorized.

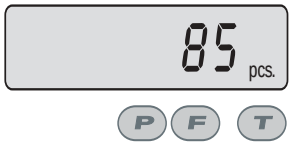


Automatic Memory Update

6. Place additional items in the tare vessel. Memory is updated automatically.

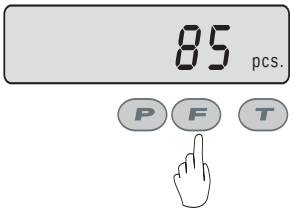


Automatic Memory Update



7. When satisfied that enough sample quantity has been placed on the scale to achieve a good average piece weight, press the F key to save it to memory. The display stops flashing and the average piece weight remains in memory until it is changed by starting a new SCS process, beginning at step one above.

End Sample Memorization



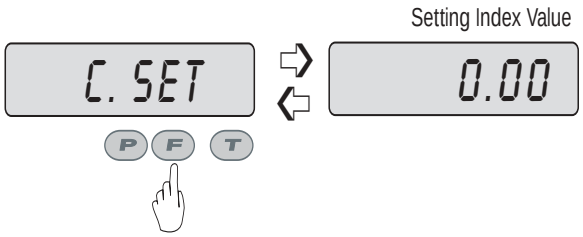
NOTE: Once the F *key has been pressed to memorize the average piece weight, repeated pressing of the* F *key allows display of the current weight and count.*

5.0 Calculation Factor Mode

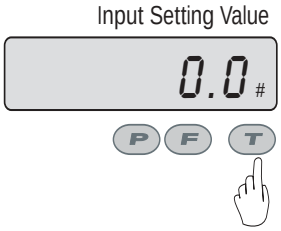
In calculation factor mode, the desired index is memorized, the index for the weight of the item placed on the scale is calculated and the calculated value is displayed. This allows conversion into various units.

5.1 Method of Operation

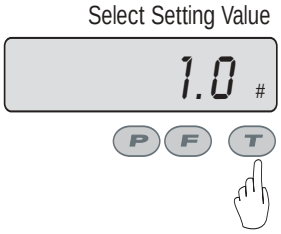
1. Hold down the F key until *[C Set]* appears. The *[M]* symbol and the display begins flashing. If a reference value has already been set, that value displays.

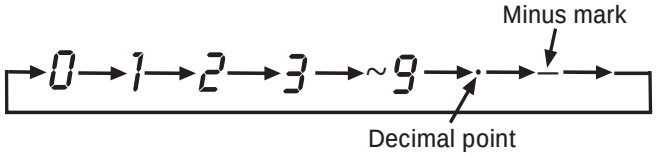


2. Press the T key until the *[0]* displays to the right side and the bar graph underneath flashes. The desired value can now be set.

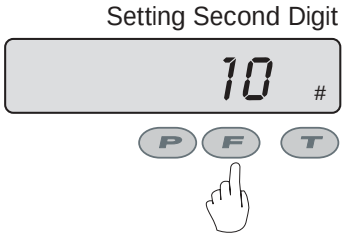


3. If the T key is pressed again, the displayed value will be incremented according to the pattern below. Press the T key repeatedly until the desired value is displayed.

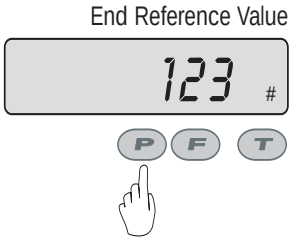




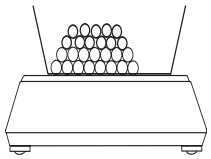
4. Press the F key to set the value previously set in step three and shift its display to the left side. Set the next digit by repeating steps three and four. Repeat this process until the desired value has been completely entered.

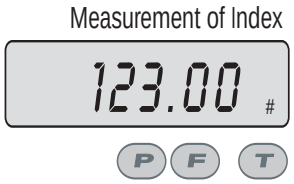


5. After the reference value has been completely set, press the P key. A long tone emits, indicating that the reference value setting has been completed and the scale returns to calculation factor mode.



6. When an item is placed on the scale, the index of its weight is calculated and the calculated value displays. This display is equal to the index (1.23) times the weight of the item (100 g).



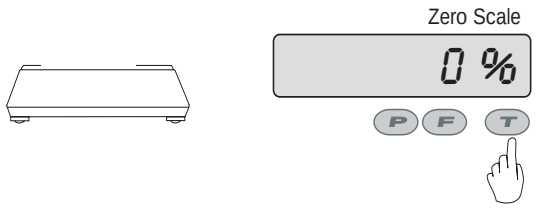


6.0 Percentage Mode

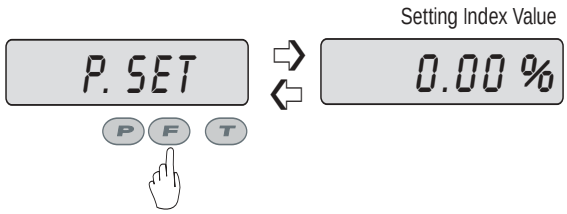
The weight of the sample selected as the reference is memorized as 100%. The ratio between the item being measured and the reference is displayed as a percentage.

6.1 Setting Actual Weight

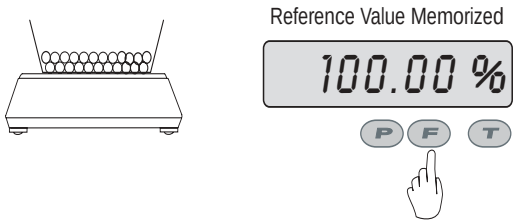
1. Press the T key to zero the scale. This operation is also performed if the tare vessel is used.



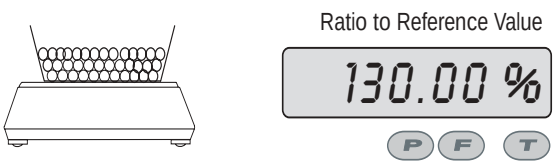
2. Continuously press the F key until *[P SEt]* displays. The *[M]* symbol and the display flash. If a reference value has been previously set, that value displays.



3. Next, place the reference sample on the weighing pan (tare vessel) and press the F key. The display temporarily goes blank and a long tone emits. The reference value is memorized and the scale returns to measurement mode.



4. Place the item to be measured on the weighing pan (tare vessel) and the ratio to the reference value is displayed in percent (%).



Note: The percentage resolution will automatically RANGE, depending on the percent of scale capacity used for the reference weight.

	IB 1000	IB 2000	IB 5000	IB 10K	IB 15K	% Scale capacity	Display resolution
Less than	.5g	1g	2.5g	5g	7.5g	.05%	*L-ERR*
Less than	5g	10g	25g	50g	75g	.5%	1%
Less than	50g	10g	250g	500g	750g	5%	0.1%
Less than	500g	1000g	2500g	5000g	7500g	50%	0.01%
More than	500g	1000g	2500g	5000g	7500g	Over 50%	0.01%

Table 6-1. Break Points for the IB Series Scale.

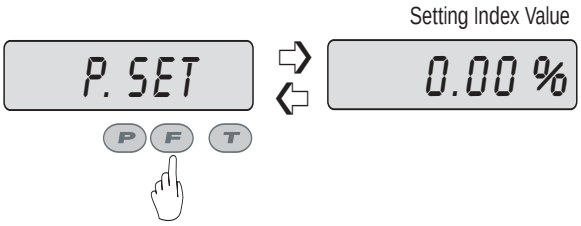
Example: IB 1000

Reference Weight: 487g

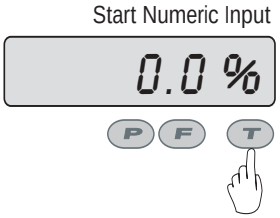
In the IB 1000 column from the table above, 487g is more than 50g, but less than 500g. The display resolution will be in increments of 0.01%.

6.2 Setting Numerical Value

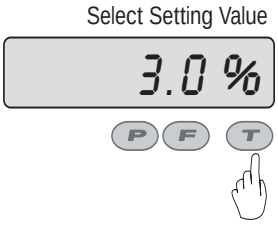
1. Press the F key until the *[P SEt]* message is displayed. The *[M]* symbol and the setting value flashes on the display. If the reference value has been previously set, that value is dislayed.

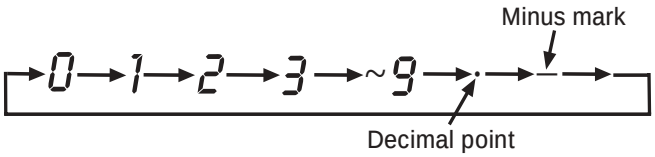


2. Press the T key until the *[0]* displays to the right side and the bar graph underneath flashes. The desired value can now be set.

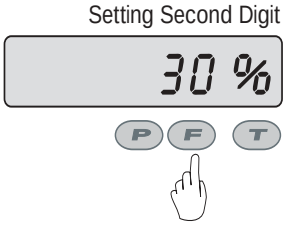


3. If the T key is pressed again, the displayed value is incremented according to the pattern below. Press the T key repeatedly until the desired value is displayed.

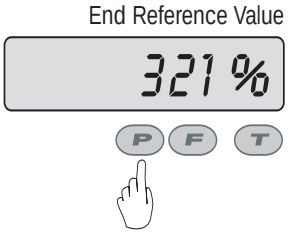




4. Press the F key to set the value previously set in step three and shift its display to the left side. Set the next digit by repeating steps three and four. Repeat this process until the desired value has been completely entered.



5. After the reference value has been completely set, press the P key. A long tone emits, indicating that the reference value setting has been completed and the scale returns to calculation factor mode.



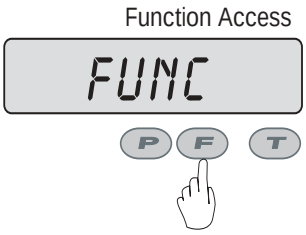
Note: The percentage display will automatically set in the range of 1 to 0.001% as with memorization of an actual reference weight.

7.0 Functions

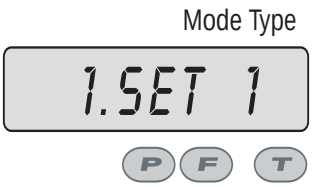
The following sections describe the functionality of the IB Series scale.

7.1 Selecting Functions

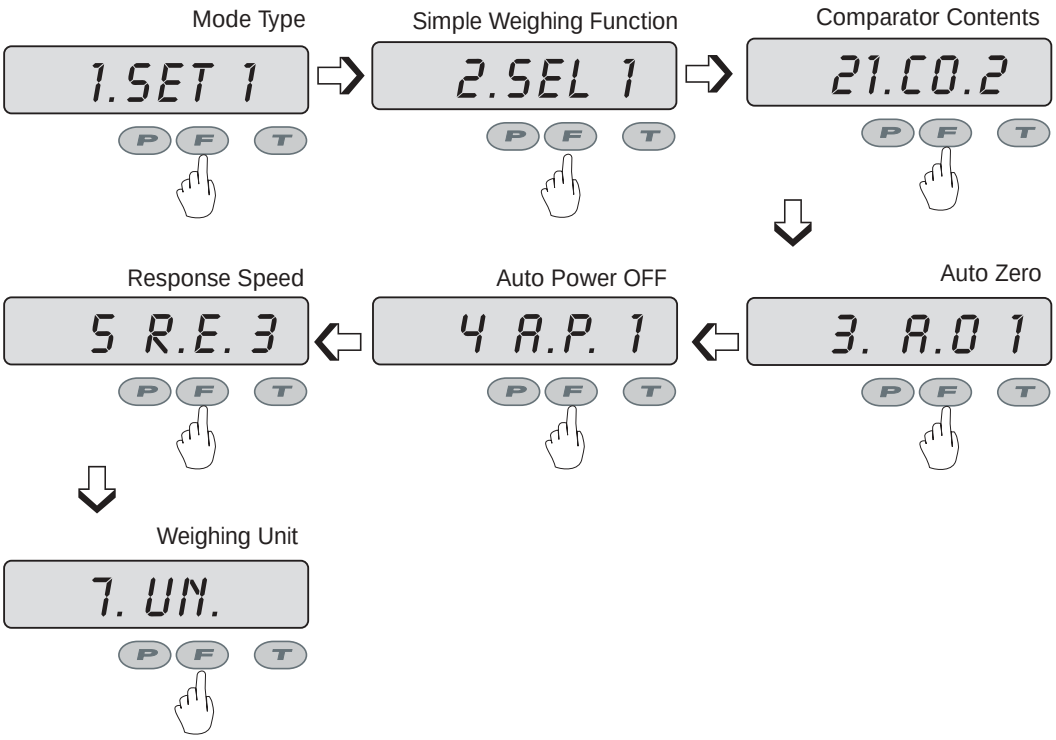
1. Hold down the F key for about four seconds. Release when the *[Func]* display appears.



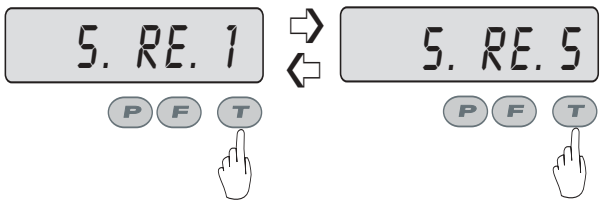
2. The first item of the function display appears: mode type.



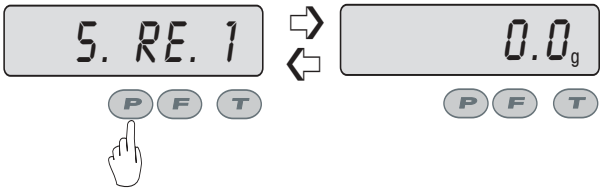
Each time the F key is pressed, the function item displays appear in sequence.



3. To alter the setting, press the T key with the desired function display showing. (See Table 7-1 on page 17).



4. After confirming the change, press the P key. The function setting is complete and the display returns to the operational mode.



7.2 Function List

Display		Function		Description			
1.SEt *	1	Mode Type		Weighing Mode (weighing only)			
	2			Counting Mode + weighing			
	3			Percentage Mode + weighing			
	4			Weight conversion + weighing			
2.SEL *	1	Additional Functions		Simple Weighing Function	Only when setting value *[34]* is selected. Proceed to type 21 function.		
	2			Accumulation Function On			
	3			Comparator Function On			
	4			Accumulation Function + Comparator Function			
3.A0 *	0	Auto Zero		No adjustment of zero point			
	1			Automatic adjustment of zero point			
4.AS *	0	Auto Power Off		With Battery Option	Continuous ON		
	1				Auto shut off after three minutes of non-usage		
5.rE *	0	Response Speed	Fast ↕ Slow	When minute amounts of liquids or powders are to be measured.			
	1			Average Display Update	Short ↕ Long	Ambient Environment	Good ↕ Poor
	2						
	3						
	4						
	5						
6.S.d *	1	Stabilization Judgement	Judgement Accuracy	Flexible ↕ Severe		Stabilization Time	Short ↕ Long
	2						
	3						
	4						
8.i.F *	0	Ouput Control		Output is not effective			
	1			Constant serial output (old format, 6-digit)			
	2			Constant serial output (old format, 7-digit)			

Table 7-1. Function List

Display		Function		Description
71 uA	1	Weighing Unit	Group “A”	mg
	2			g
	3			kg
	4			ct
	5			oz
	6			lb
	7			ozt
	8			dwt
	9			gr
	A			tl (Hong Kong)
	B			tl (Singapore, Malaysia)
	C			tl (Taiwan)
	D			mon
72 dA	1	Least Readability		Fine Ex. IB-2000 0.001g 0.02g 0.05g 0.1g 0.2g Coarse
	2			
	3			
	4			
	5			

Table 7-1. Function List (Continued)

Display		Function		Description
73 uR	0	Weighing Unit	Group “B”	No unit displayed
	1			mg
	2			g
	3			kg
	4			ct
	5			oz
	6			lb
	7			ozt
	8			dwt
	9			gr
	A			tl (Hong Kong)
	B			tl (Singapore, Malaysia)
	C			tl (Taiwan)
	D			mon
74 dR	1	Least Readability		Fine Ex. IB-2000 0.001g 0.02g 0.05g 0.1g 0.2g Coarse
	2			
	3			
	4			
	5			

Table 7-1. Function List (Continued)

** = indicates default setting at time of factory shipment.*

Notes:

- *If activate comparator function is selected, the comparator function data shown in Figure 7.2.1 will supersede the auto zero display.*
- *If activate interface function is selected, the interface function data shown on page 21 will supersede the Auto Zero display. If this display is shown, the display will return to the normal operational mode.*
- *The auto power off function is available only when the battery option is used.*

7.2.1 Comparator Function Data

Display		Contents	Description		
21.Co *	1	Judgment Condition	Judgment even when scale unstable		
	2		Judgment only when scale is stable		
22.Li *	0	Judgment Range	No judgment around zero point		
	1		Total range includes zero point		
23.Pn	1	Number of Setting Points	Setting point no. 1		The message “25 LG 2” is displayed only during setting of two points, it is not valid when setting 1, 3 or 4 points.
	2		Setting point no. 2		
	3		Setting point no. 3		
	4		Setting point no. 4		
24.Bu *	0	Buzzer Operation (*1: Option)	Off (buzzer suppressed) [◀] mark ON when buzzer deactivated		
	1		Active	Under	The buzzer position is shown by the [◀] mark flashing next to UNDER/ ACCEPT/OVER. This facilitates monitoring judgment results.
	2		Active	Accept	
	3		Active	Over	
	4		Active	Under & Accept	
	5		Active	Accept & Over	
	6		Active	Under & Over	
25.LG *	1	Judgment Display	Ranking Display		
	2		Two-point bar graph (effective only when 2 points set)		

Table 7-2. Comparator Function Data

**1: Buzzer sounds only when buzzer is attached. Option relay output is also common when buzzer output.*

7.2.2 Interface Data

Display		Item	Status
81oc *	0	Output Control	Output disabled
	1		Normal operation, continuous output
	2		Continued output when stable (stop if unstable)
	3		Press the P key X 1 to ouput (manual) printer X 1
	4		Automatic output X 1 after load stabilized
	5		Stable = output X 1; unstable = no output
	6		Stable = output X 1; unstable = continue output
	7		Press the P key once to output X 1
82 bL. *	1	Baud Rate	1200 BPS
	2		2400 BPS
	3		4800 BPS

Table 7-3. Interface Data

Note:

- ** denotes default setting at time of factory shipment.*
- *Weight units other than "g", "kg" and "lb" are indicated by a [▸] mark. A decal with the unit printed on it can be attached over this mark.*

7.2.3 Measurement Conditions and Results

	Integration Time	Stabilization Speed	Results
Conditions Good ↓ Normal ↓ Worse	SrE1 ↓ SrE3 ↓ SrE4	65d 4 ↓ 65d 3 ↓ 65d 1	Accurate ↓ Less Accurate
Measurement Precise ↓ Normal ↓ Coarse	SrE4 ↓ SrE3 ↓ SrE1	65d 4 ↓ 65d 3 ↓ 65d 1	Slow ↓ Quick

Table 7-4. Measurement Conditions and Results

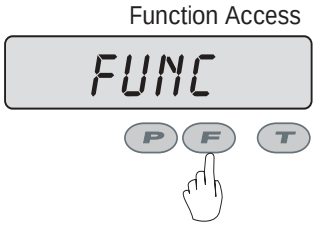
8.0 Comparator Function

The comparator function is convenient for classifying weighing items according to pre-determined weight ranges. The upper and lower limits of this range are stored in the scale's memory, and when an item is placed on the weighing pan it is judged as either acceptable or unacceptable. This function can only be used in weighing mode.

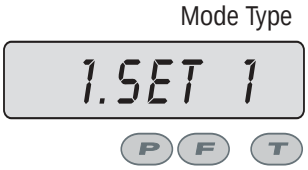
8.1 Upper and Lower Limit Setting Procedure

To set the upper and lower limits, follow this procedure while referring to Section 8.3 on page 24.

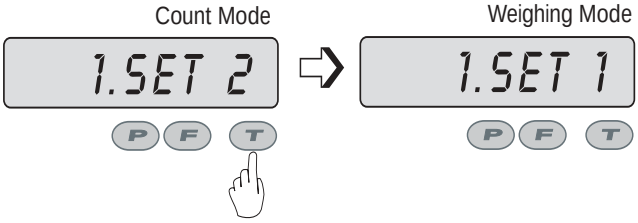
1. Hold down the F key for about four seconds. Release when the *[Func]* display appears.



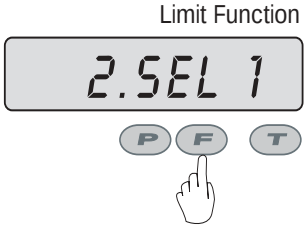
2. The first item of the function display appears: mode type.



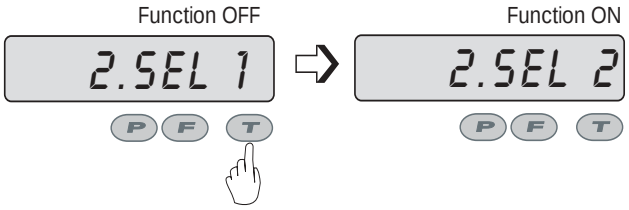
3. If the count mode display appears, press the T key to enter the weighing mode.



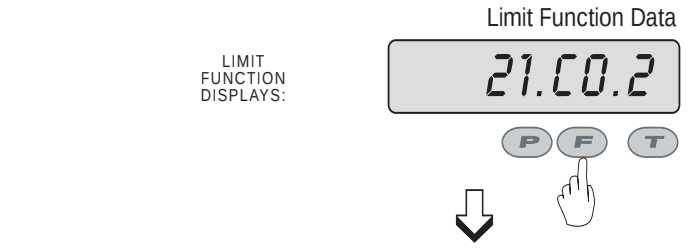
4. Press the F key. The limit function display appears.

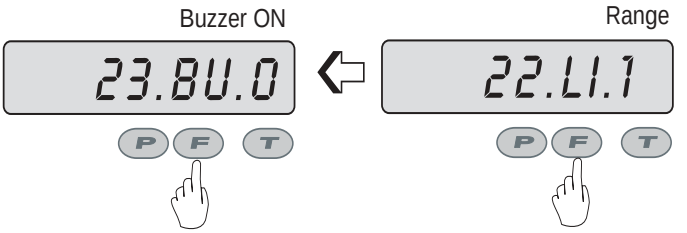


5. Press the T key. The function on display appears.

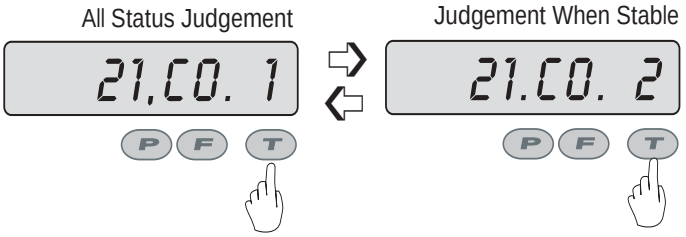


6. Press the F key. The first limit function display appears. Press the F key repeatedly to call up the limit function displays in sequence.

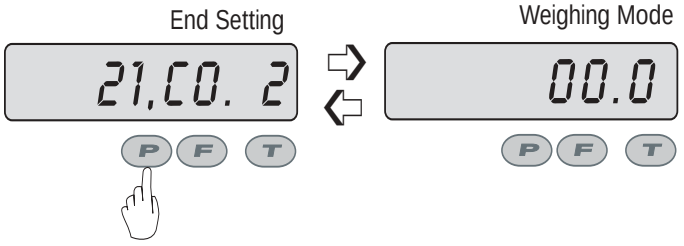




7. To change the setting parameters, press the T key with the desired limit function display showing.



8. After each parameter is set, press the P key to return to weighing mode.

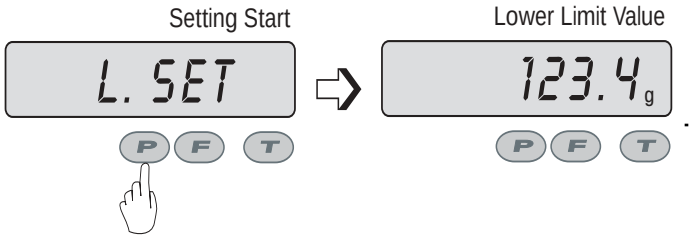


Notes:

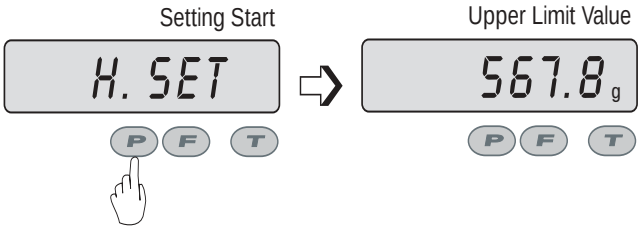
- *To confirm function setting status, press the* F *key with the function item display showing (in step two above) display function settings in sequence.*
- *To end setting sequence at any time, press the* P *key to return to weighing mode.*

8.2 Setting Confirmation and Input Procedure

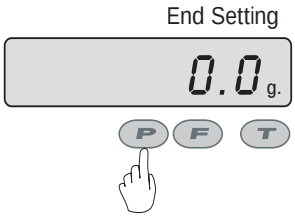
1. Hold the P key down for two to three seconds. Release when the display shows *L.SEt* (lower limit set). The *[◂]* indicator next to UNDER flashes and the lower limit value is displayed.



2. Press the P key to display *H.SEt* (high [upper] limit set). The *[◂]* indicator next to OVER flashes and the lower limit value is displayed.



3. Press the P key to end setting sequence and return to weighing mode.



Note: If the L.SEt display does not appear, the scale is not in function setting mode, or the count mode is in effect (pcs displayed as unit indicator).

8.3 Upper/Lower Limit Input

There are two methods of entering upper and lower limit values. Both methods can be used interchangeably.

1. Actual weight input procedure: samples of upper and lower limit weight are placed on the weighing pan.
2. Numeric input procedure: the F and P keys are used with numeric key entry to record upper and lower limits into the scale's memory.

The judgement results are shown by the position of the lit *[◂]* indicator next to OVER/ACCEPT or UNDER.

H (high) Measured weight is over the upper limit ..... upper limit $\leqq$ weight

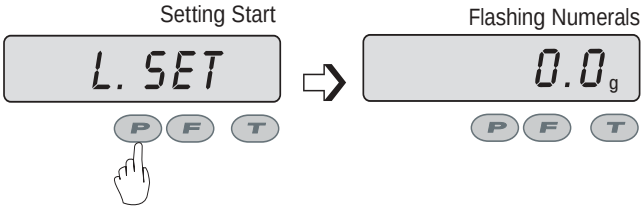
C (good) Measured weight is within acceptable range..... upper limit $>$ weight $>$ lower limit

L (low) Measured weight is under the lower limit ..... lower limit $\geqq$ weight

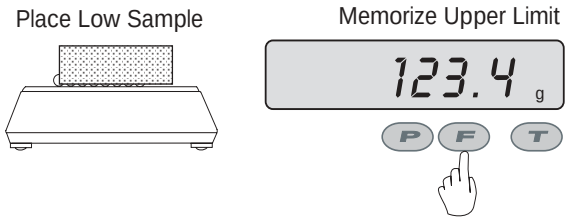
Note: In the case where lower limit $\geqq$ *upper limit, the flashing [◂] appears next to all OVER/ACCEPT/UNDER indicators to alert operator to error data.*

8.3.1 Actual Weight Input

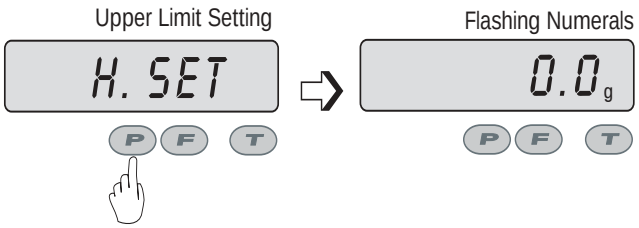
1. Hold the P key down for two to three seconds. Release when the display shows *L.SEt* (lower limit set). The indicator next to UNDER will flash.



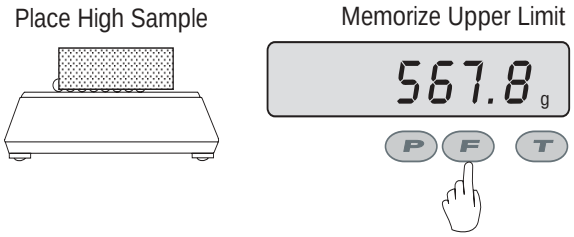
2. Place a sample of the actual lower limit weight on the weigh pan and press the F key. The display goes blank for a moment while the lower limit value is memorized.



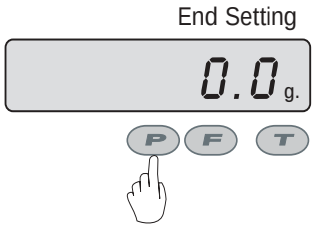
3. Press the P key to change to the upper limit setting display. The indicator next to OVER flashes.



4. Place a sample of the actual upper limit weight on the weigh pan and press the F key. The display is blank for a moment while the upper limit value is memorized.



5. Press the P key to end the setting sequence and return to the weighing mode.

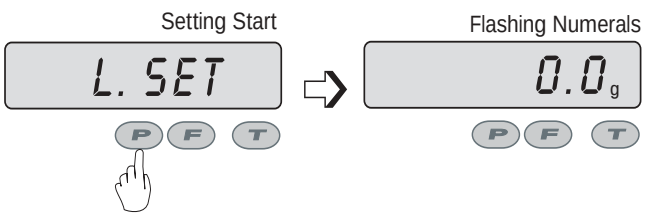


Notes:

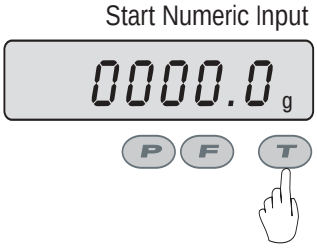
- *The actual weight setting can be revised as many times as needed by repeating steps two and four.*
- *When using the F key to advance the digit during numeric setting, the highest place (10.000) can only be entered to the QB-12K. Also, the next highest place M flashing indicates a (+ -) symbol should be selected.*
- *A flashing triangle [◂] appearing next to all OVER/ ACCEPT/ UNDER indicators alerts operators to error data. It may be caused by mis-entry or lower limit ≥ upper limit setting value. Check the relevant settings if this occurs.*

8.3.2 Numeric Input Procedure

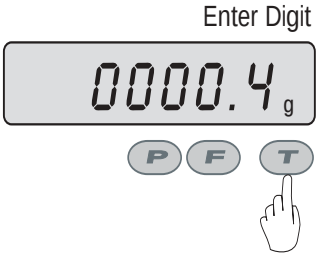
1. Hold the P key down for two to three seconds. Release when the display shows *L.SEt* (lower limit set). The indicator next to UNDER flashes.

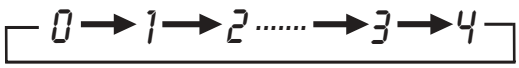


2. Press the T key to commence value setting. All digits are displayed and only the lowest digit flashes to indicate that input can be made to that position.

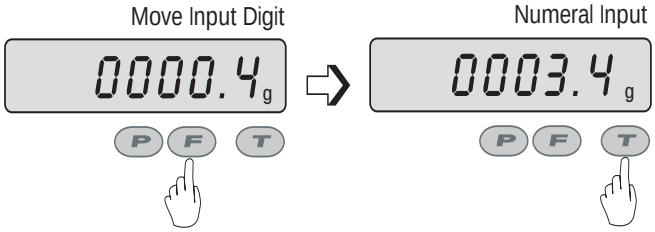


3. Press the T key again to select a numeral. Each time the key is pressed, a new numeral is advanced.

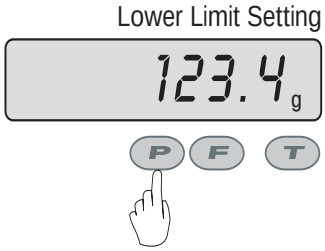




4. If the F key is pressed, the next digit position flashes, and the input position shifts accordingly. Enter numeral as in the third step above.



5. Continue entering the required numerals as above. When all numerals have been entered, press the P key to record lower limit value in memory.

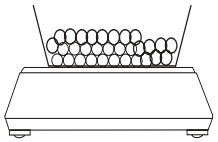


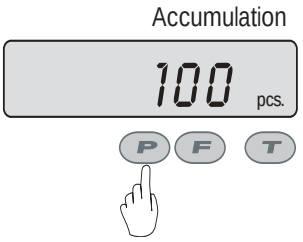
9.0 Accumulation Function

The accumulation function of the IB Series offers summing-up and display of measured data repeatedly. Useful in mixing or filling applications.

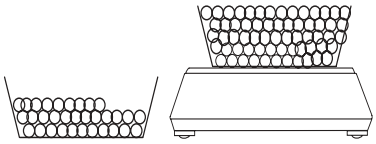
9.1 Operation

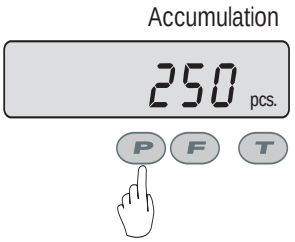
1. Load an object on the scale. When the display shows ⊙, press the P key to accumulate the display value. The total value and ∑ is displayed for a moment.



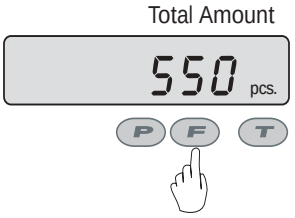


2. Unload the object and allow the balance to stabilize and re-zero. Display will show ⊙. Once stabilized, load next object and press the P key to accumulate the value as in step 1 above.





3. Press the F key to display the total amount. To clear the accumulated total to zero, press the T key.



Notes:

• Pressing the S *key before stabilization may cause inaccurate accumulation reading.*

• Accumulation is not effective if weighing in Mode "B" in simple weighing mode.

• To avoid duplication without unloading first object, press the T *key after step 1 above to continue the accumulation. Display will show [0], and next object can then be added on top of previous object remaining on scale. Useful for mixing.*

• In counting mode, renewal of unit weight will automatically clear the total.

10.0 Specifications

This section contains charts for specifications and model data for the IB Series scale.

10.1 Specifications

Refer to the tables below for common specifications and model specific data.

10.1.1 Common Specifications

Item	Specification
Measurement method	Tuning fork type
Tare subtraction	Full capacity, one-touch adjustment (measurable range = capacity - tare weight)
Zero adjustment	Auto zero (can be set to OFF)
Display	Maximum 6 column liquid crystal display
Weight correction	Semi-automatic span adjustment
Over-scale display	*[0-Err]* message. (If weight = capacity + 9 digits)
Ambient temperature/humidity	0~40° C, 80% relative humidity or less
Power	Specialized AC adapter (AC 110V⟶DC9V, 400 mA)

Table 10-1. Common Specifications

10.1.2 Model Specific Data

Model	Capacity	Minimum Graduations	Resolution	Pan Dimensions
IB-1000	1000g	0.005g	1/200,000	170mm
IB-2000	2000g	0.01g	1/200,000	
IB-5000	5000g	0.01g	1/500,000	220mm X 180mm
IB-10K	10kg	0.05g	1/20,000	
IB-15K	15Kg	0.1g	1/150,000	

Table 10-2. Model Specific Data

** In counting mode, the minimum unit is equal to the minimum graduation value.*

10.2 Options and Standard Attachments

Options

- IJ output: for connecting peripherals (printer, comparator, etc.)
- Buzzer output: judgment result alert buzzer function + IJ output.
- Limit output: judgment result alert buzzer connection output + specialized printer output.
- RS-232C output: for two-way communication with peripheral or external units.
- Battery drive: 48-hour charge (when not using output) for use where no service outlet is available.

Standard Attachments

- AC Adaptor
- Dust cover

10.3 Model Capacity/Readability Tables

IB-1000

Set C	Unit	Mark	Capacity	Readability
1	mg	mg	1,000,000	10
2	g	g	1,000	0.01
3	kg	kg	1.0	0.00001
4	ct	ct	5,000	0.05
5	oz	▶	35	0.0005
6	lb	▶	2.2	0.00002
7	ozt	▶	32	0.0005
8	dwt	▶	640	.01
9	gr	▶	15,000	0.2
A	HK tael	▶	26	0.0002
B	SIN tael	▶	26	0.0002
C	TW tael	▶	26	0.0002
D	mom	▶	260	0.002

IB-2000

Set C	Unit	Mark	Capacity	Readability
1	mg	mg	2,000,000	10
2	g	g	2,000	0.01
3	kg	kg	2	0.00001
4	ct	ct	10,000	0.05
5	oz	▶	70	0.0005
6	lb	▶	4.4	0.00002
7	ozt	▶	64	0.0005
8	dwt	▶	1,200	0.005
9	gr	▶	30,000	0.2
A	HK tael	▶	53	0.0002
B	SIN tael	▶	52	0.0002
C	TW tael	▶	53	0.0002
D	mom	▶	530	0.002

IB-5000

Set C	Unit	Mark	Capacity	Readability
1	mg	mg	5,000,000	100
2	g	g	5,000	.01
3	kg	kg	5	.0001
4	ct	ct	25,000	.5
5	oz	▶	170	0.002
6	lb	▶	11	0.0002
7	ozt	▶	160	0.002
8	dwt	▶	3,200	0.05
9	gr	▶	77,000	2
A	HK tael	▶	130	.002
B	SIN tael	▶	130	.002
C	TW tael	▶	130	.002
D	mom	▶	1,300	0.02

IB-10K

Set C	Unit	Mark	Capacity	Readability
1	mg	mg	10,000,000	50
2	g	g	10,000	.05
3	kg	kg	10	0.00005
4	ct	ct	50,000	0.2
5	oz	▶	350	0.002
6	lb	▶	22	0.0001
7	ozt	▶	320	0.002
8	dwt	▶	6,400	0.05
9	gr	▶	150.000	1
A	HK tael	▶	260	0.001
B	SIN tael	▶	260	0.001
C	TW tael	▶	260	0.001
D	mom	▶	2,600	0.01

IB-15K

Set C	Unit	Mark	Capacity	Readability
1	mg	mg	15,000,000	100
2	g	g	15,000	0.1
3	kg	kg	15	0.0001
4	ct	ct	75,000	0.5
5	oz	▶	520	0.005
6	lb	▶	33	0.0002
7	ozt	▶	480	0.005
8	dwt	▶	9600	0.05
9	gr	▶	230,000	2
A	HK tael	▶	400	0.002
B	SIN tael	▶	390	0.002
C	TW tael	▶	400	0.002
D	mom	▶	4,000	0.02

11.0 Troubleshooting

The following section contains a troubleshooting chart for the IB Series scale. Refer to this chart to locate causes and countermeasures to various conditions.

Condition	Cause	Countermeasure
Limit function data cannot be set	• Scale is not set to Limit Function mode • Upper and lower limits have not been set, or lower limit ≥ upper limit setting has been entered [▶] mark will flash at OVER/ACCEPT/ UNDER positions.	• Check that limit function settings are correct: See page 27
Display will not stabilize	• Wind or vibration is affecting scale	• Set up scale elsewhere
	• Scale is set on unstable surface	• Set scale level
	• Extended usage or moving scale has affected span value	• Perform span adjustment
Displayed value is in error. Weight value deviating	• Mis-performed tare subtraction	• Reset tare subtraction
	• Scale is not set level	• Set scale level
	• Extended usage or moving scale has affected span value	• Perform span adjustment
Linearity error	• Mechanical adjustment has changed due to some modification in scale characteristics, etc	• Consult your local Rice Lake Weighing Systems Service distributor
Display is blank	• Adapter is not connected • Battery needs recharging • Auto Power OFF is activated	• Recharge battery • Press the ON/OFF
Scale will not weigh up to rated capacity	• Tare + sample weight exceeds capacity • (Weight range = maximum capacity - tare weight)	• Recheck tare weight
The LOW-BATT lamp is lit	• If the battery option is employed, the voltage of the internal batteries has dropped	• Recharge batteries or connect the AC adapter
The SLEEP lamp is lit	• If the battery option is employed, the displayed value has not been used for more than three minutes	• Press a key or weigh an item
b-ERR	• Electronic malfunction due to static electricity electromagnetic interference	• Consult your local Rice Lake Weighing Systems distributor
O-ERR U-ERR	• Capacity is exceeded • Tare is overweight (Weighing value = sample weight + tare weight) • Something contacting and holding up pan or pan base	

Table 11-1. Troubleshooting Chart

IB Series Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all RLWS equipment and systems manufactured and sold by RLWS and properly installed by an authorized RLWS Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by rlws. All systems and components are warranted against defects in materials and workmanship for five years.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

- Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, *Protecting Your Components From Static Damage in Shipment*, available from RLWS Equipment Return Department.
- Examination of such equipment by RLWS confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; RLWS shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will RLWS be liable for the cost of any repairs made by others.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

RLWS AND BUYER AGREE THAT RLWS' SOLE AND EXCLUSIVE LIABILITY HEREUNDER IS LIMITED TO REPAIR OR REPLACEMENT OF SUCH GOODS. IN ACCEPTING THIS WARRANTY, THE BUYER WAIVES ANY AND ALL OTHER CLAIMS TO WARRANTY.

SHOULD THE SELLER BE OTHER THAN RLWS, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.

NO TERMS, CONDITIONS, UNDERSTANDING, OR AGREEMENTS PURPORTING TO MODIFY THE TERMS OF THIS WARRANTY SHALL HAVE ANY LEGAL EFFECT UNLESS MADE IN WRITING AND SIGNED BY A CORPORATE OFFICER OF RLWS AND THE BUYER.

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